Appendix A

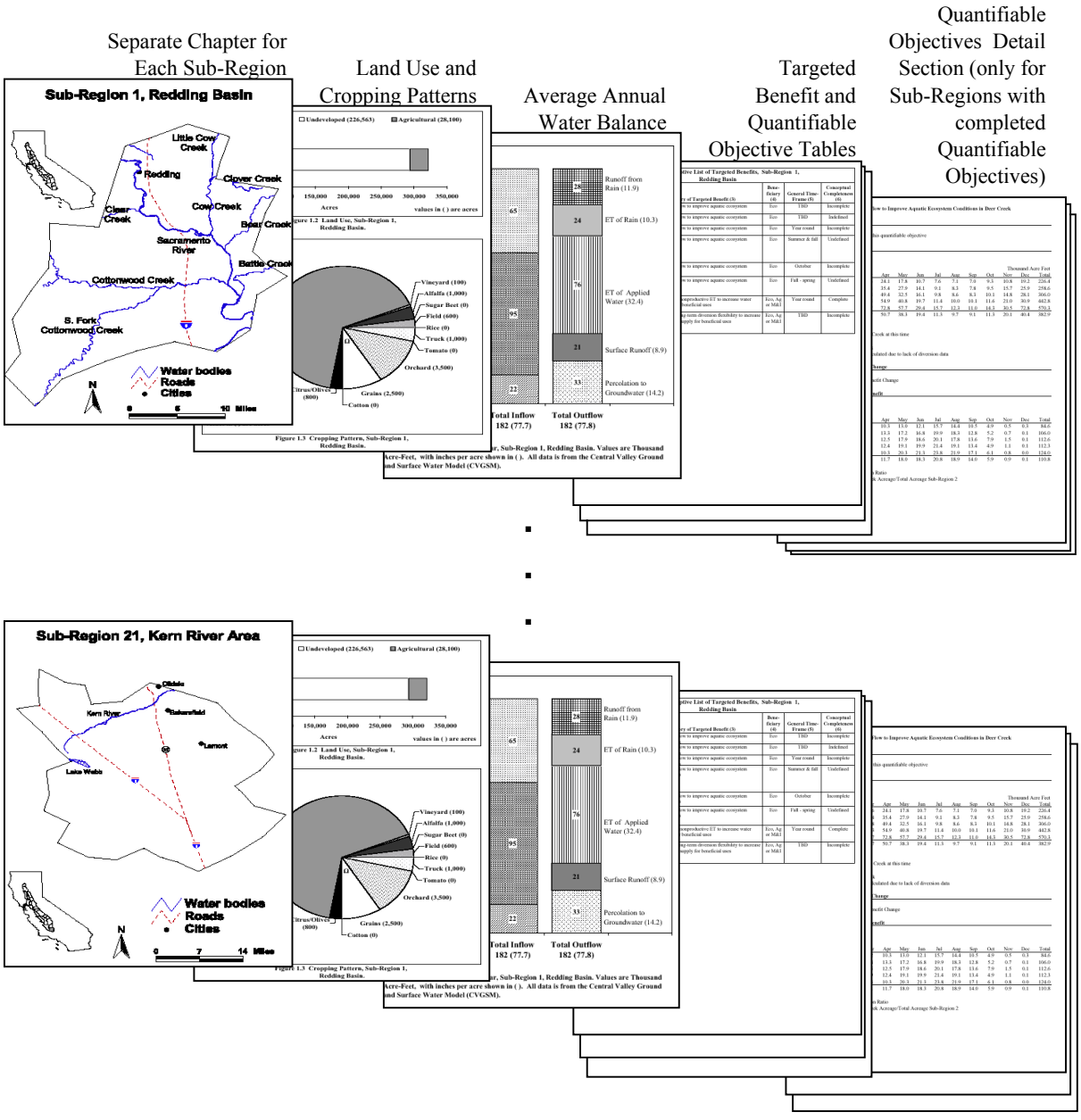
Complete List of Quantifiable Objectives by Sub-Region

Appendix A contains a list of the completed and potential Quantifiable Objectives (QOs). To-date, 196 potential QOs have been identified. Of these, approximately 50 have been completed. WUE proposals that incorporate completed QOs will be given extra weight in the selection process.

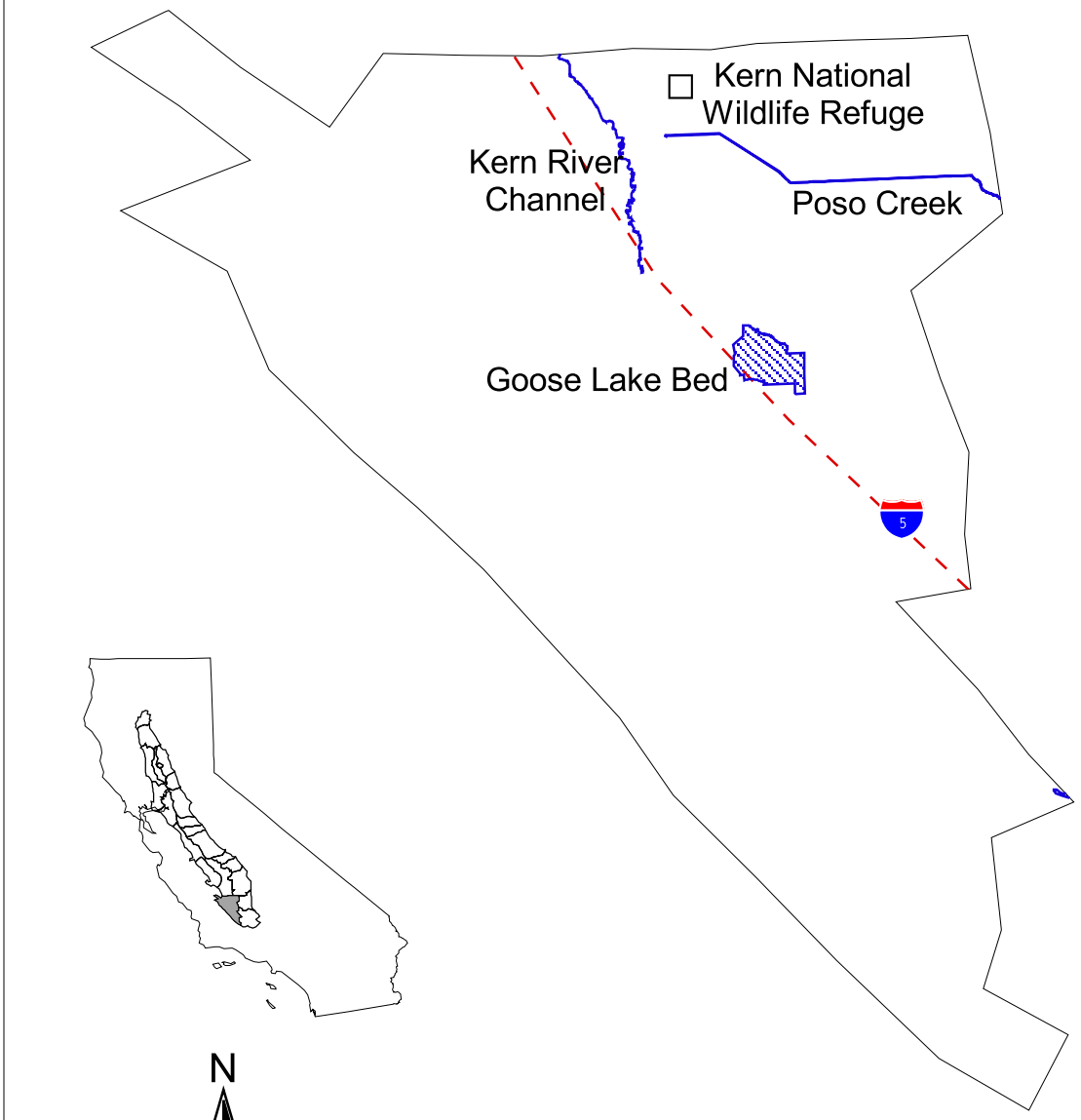
Readily available data does not exist to allow completion of the remaining QOs. However, approximately 45 of the uncompleted QOs have been identified as high priority, and proposals that are linked to these priority outcomes (or Targeted Benefits) will also receive extra weight in the selections (although not as much weight as those that incorporate completed QOs).

Appendix A is organized into 21 chapters that correspond to the 21 Sub-Regions defined in the QO analysis. Each chapter contains background information and details as illustrated in Figure A.I.

Figure A.I. Organization of Appendix A



Sub-Region 19, Western Kern County



N

0 6 12 Miles

Water bodies

Roads

Wetlands

Figure A.19.2 Land Use, Sub-Region 19, Western Kern County.

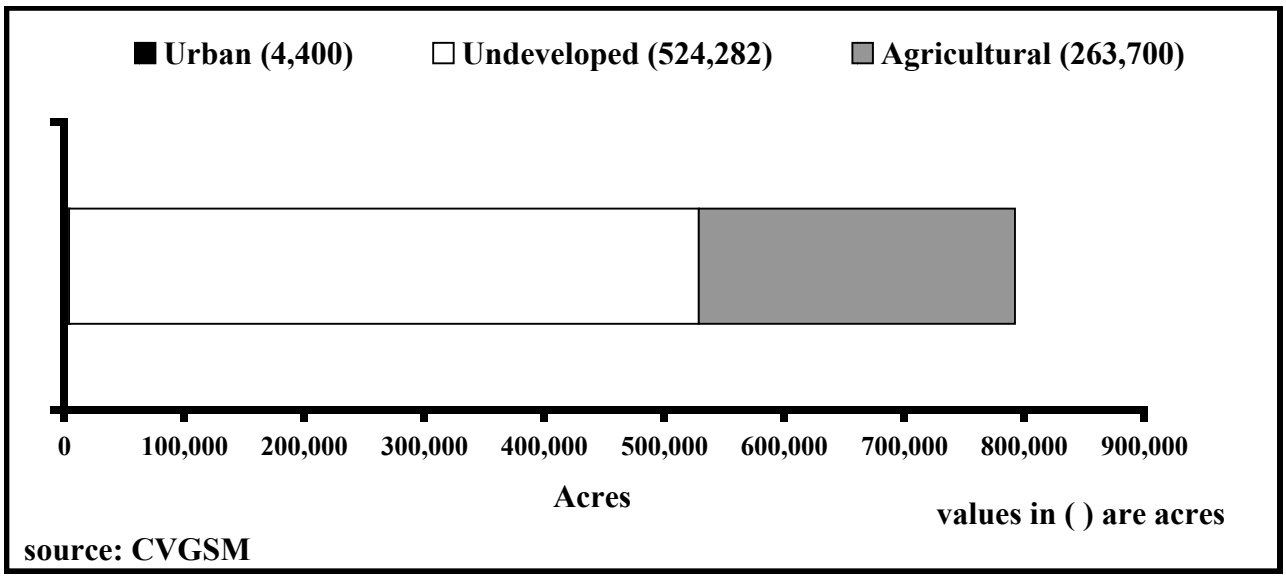
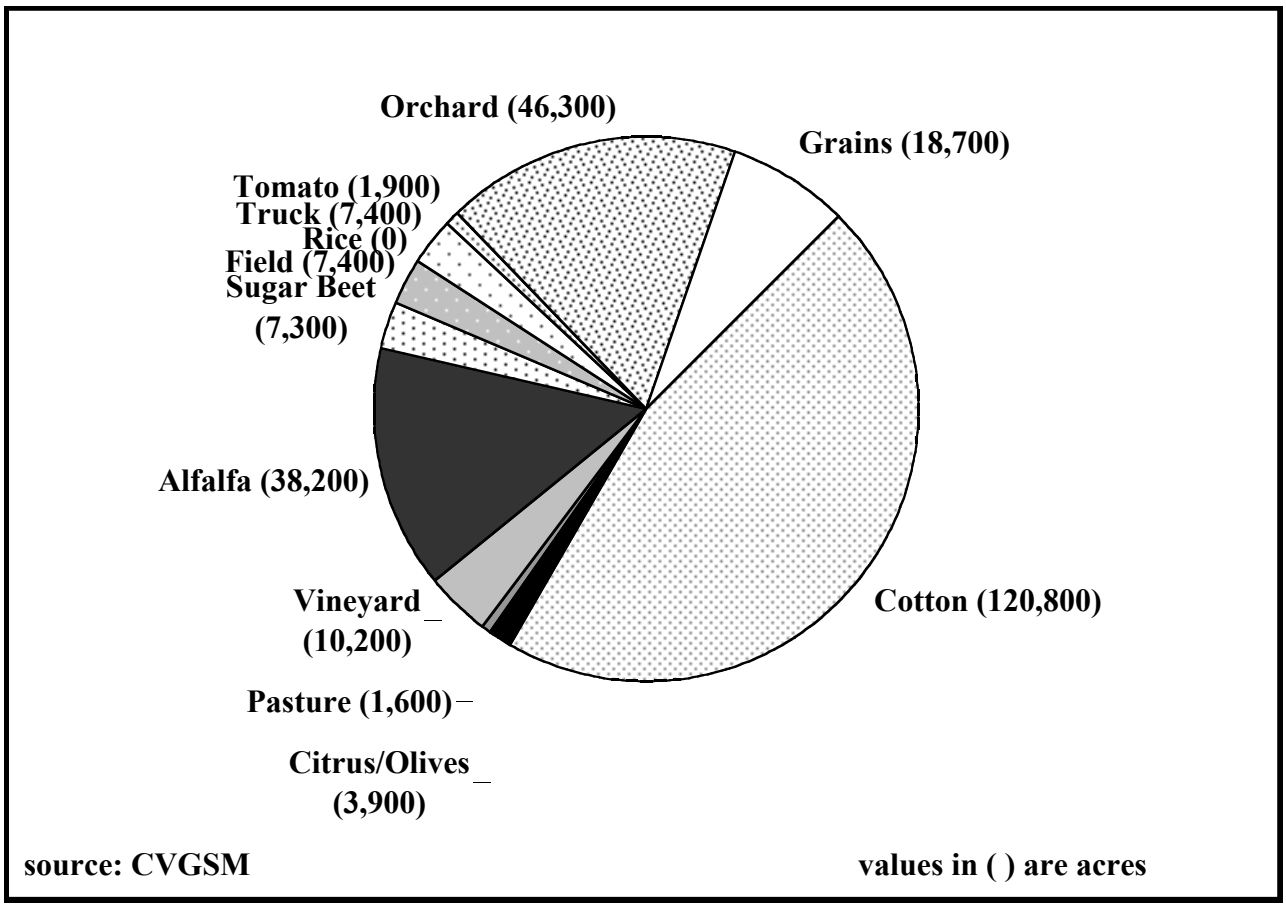
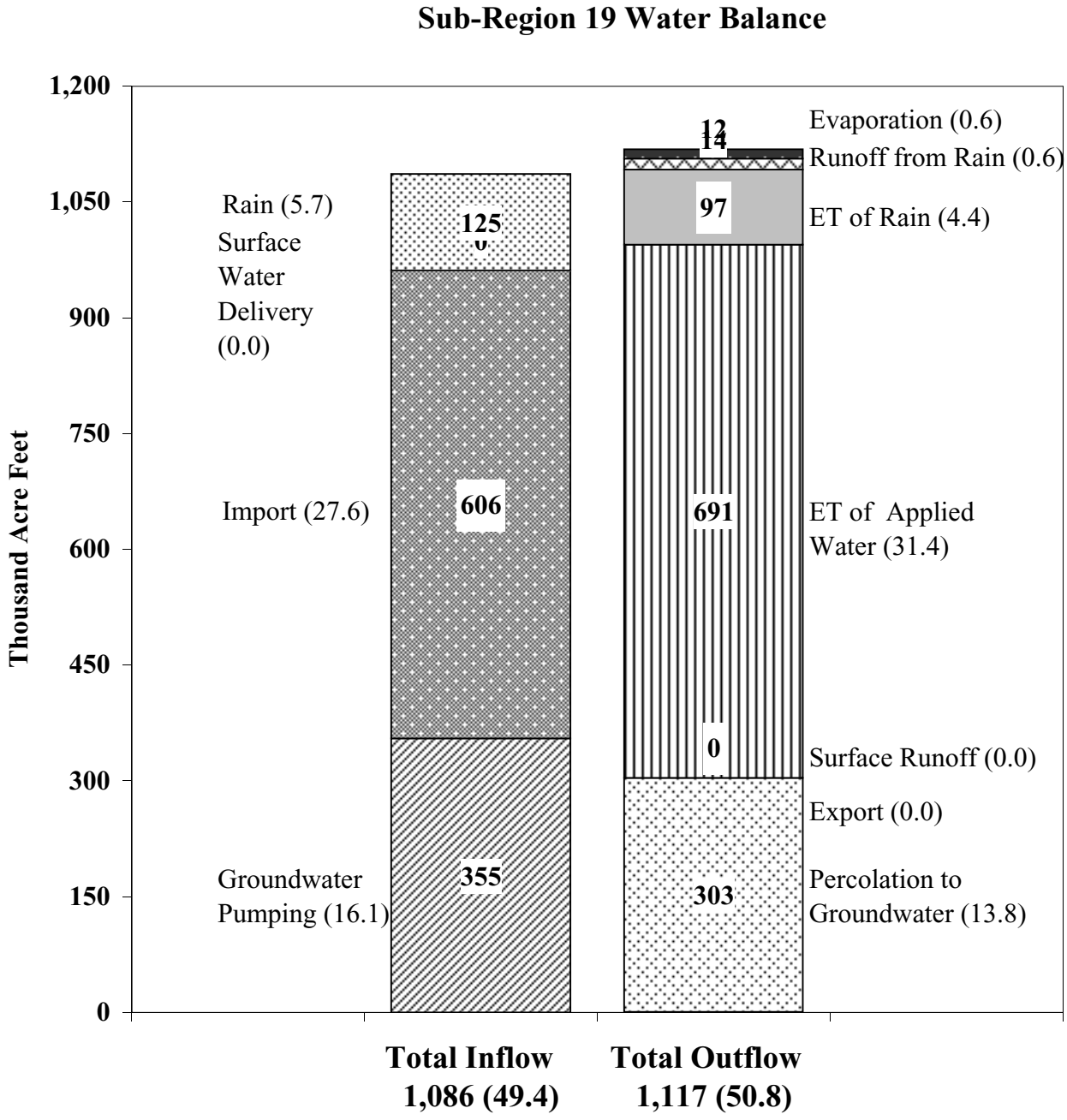


Figure A.19.3 Cropping Pattern, Sub-Region 19, Western Kern County.





Farm Water Balance, Average Year, Sub-Region 19, Western Kern County. Values are Thousand Acre-Feet, with inches per acre shown in ( ). All data is from the Central Valley Ground and Surface Water Model (CVGSM).

Table A.19.1. Descriptive List of Targeted Benefits, Sub-Region 19, Western Kern County					
TB # (1) [duplicate]	**Location (2)**	**Category of Targeted Benefit (3)**	**Bene-ficiary (4)**	**General Time-Frame (5)**	**Conceptual Completeness (6)**
188	All affected lands	Quantity: Decrease flows to salt sinks to increase the water supply for beneficial uses	Eco, Ag or M&I	Irrigation season	Incomplete
189	All affected lands	Quantity: Decrease nonproductive ET to increase water supply for beneficial uses	Eco, Ag or M&I	Year round	Complete
190	All suitable lands	Quantity: Provide long-term diversion flexibility to increase the water supply for beneficial uses	Eco, Ag or M&I	TBD	Incomplete
191	Kern National Wildlife Refuge	Quantity: Provide long-term diversion flexibility to increase the water supply for beneficial uses	Eco	Variable (mostly winter)	Incomplete
192	Salt affected soils	Quantity: Provide long-term diversion flexibility to increase the water supply for beneficial uses	Ag	Irrigation season	Incomplete

Table A.19.2. Quantified Targeted Benefits, Sub-Region 19, Western Kern County	
TB # (1) [duplicate]	**Source and Description of Quantified Targeted Benefit (7)**
188	Core: Reduce existing flows to salt sinks by _____ acre-feet per year.
189	Core: Reduce unwanted ET by _____ acre-feet per year.
190	Core: Enhance the effectiveness of potential conjunctive use programs by reducing flows to groundwater to _____ acre feet per year during periods of shortage; and increasing flows to groundwater to _____ acre feet per year during periods of excess.
191	Core: Provide water for the Kern National Wildlife Refuge. The following water quantities are required for the following wetland types: seasonal marsh, 4.1 - 8.5 acre-feet/acre; permanent and semipermanent marsh or brood pond, 7.4 - 13.25 acre-feet/acre; managed riparian, 4.0 - 8.0 acre-feet/acre; upland, 4.25 acre-feet/acre; and reverse-cycle, 5.25 acre-feet/acre.
192	Core: While remaining within the salinity threshold for a given crop, take advantage of periodic opportunities to reduce salinity impacts by increasing leaching by _____ during periods of excess supply and by reducing by ____ leaching during water short periods.

Table A.19.3. Quantified Targeted Benefit Change, Sub-Region 19, Western Kern County								
	Reference Condition		Quantified Targeted Benefit		Quantified Targeted Benefit Change			
TB # (1) [duplicate]	Data Source (8)	Data Availability (9)	Data Source (8)	Data Availability (9)	Data Source (8)	Data Availability (9)	Range of Values (10)	Specific Time-Frame (11)
188	CVGSM/Core	Rough estimate	Core	Rough estimate	Calculated	Rough estimate	<1 TAF/yr	Irrigation season
189	CVGSM	Unproven-precise	Core	Rough estimate	Calculated	Rough estimate	4.5 TAF/yr	TBD
190	CVGSM	Unproven-precise	Core	Rough estimate	Calculated	Rough estimate	TBD	TBD
191	RWS (ICP)	Insufficient	RWS (ICP)	Unproven - precise	Not available	Insufficient	Not available	Not available
192	Core	Rough estimate	Core	Rough estimate	Calculated	Rough estimate	TBD	Irrigation season

Table A.19.4. Quantifiable Objective, Sub-Region 19, Western Kern County		
TB # (1) [duplicate]	**Achievable Agricultural Potential (12)**	**Quantifiable Objective (13)**
188	<1 TAF per year	<1 TAF per year
189	4.5 TAF per year plus additional water generated through reduction in application through improved irrigation systems	4.5 TAF per year plus additional water generated through reduction in application through improved irrigation systems
190	TBD	TBD
191	TBD	TBD
192	TBD	TBD

Table A.19.5. Affected Flow Paths and Possible Actions, Sub-Region 19, Western Kern County		
TB # (1) [duplicate]	**Affected Flow Paths (14)**	**Possible Actions (provided as examples; proposers are encouraged to consider local actions that are not listed) (15)**
188	Percolation to Groundwater	Improve farm irrigation management (such as irrigation scheduling) and more uniform irrigation methods (such as shorter furrows, sprinkler, or drip).
189	ETAW	Reduce ET flows using improved irrigation methods, such as drip irrigation, and planting densities.
190	TBD	TBD
191	TBD	TBD
192	TBD	TBD

Detail 188, Reduce Groundwater Flows to Salt Sinks

1. Quantified Targets

Reduce unwanted flows to salt sinks in Subregion 19

2. Reference Condition

A. Groundwater Return Sub-Region 19 * Step 4. (outflow, recoverable)

source: CVGSM Sub-Region 19 — Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.8
2) Dry	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	1.1
3) B Norm	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	1.2
4) A Norm	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	1.2
5) Wet	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	1.3
Wtd Avg.	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	1.1

3. Quantified Targeted Benefit Change

A. Quantified Targeted Benefit Change for Sub-Region 19

source: DWR - San Joaquin Valley Drainage Monitoring Program (December, 1998) — Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
All Year Types			0	56	56	11	113	4	4	0	0	0	243

4. Area Affected By Targeted Benefit

A. Ratio of Tiled Acres to Total Acres in Subregion

source: DWR - San Joaquin Valley Drainage Monitoring Program (December, 1998)

Tiled Acres	Total Acres in Subregion	Tiled as Percent of Total
1,420	794,282	0.2%

5. Water Balance - Flow Path Elements

A. Rain Sub-Region 19 * Step 4. (inflow) — Flow Path Not Affected

source: CVGSM Sub-Region 19 — Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
2) Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
3) B Norm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
4) A Norm	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
5) Wet	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Wtd Avg.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2

B. Surface Water Diversions Sub-Region 19 * Step 4. (inflow) — Flow Path Not Affected

source: CVGSM Sub-Region 19 — Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2) Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3) B Norm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4) A Norm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5) Wet	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wtd Avg.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

C. Import Sub-Region 19 * Step 4. (inflow) — Flow Path Not Affected

source: CVGSM Sub-Region 19 — Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.7
2) Dry	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	1.1
3) B Norm	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	1.2
4) A Norm	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	1.2
5) Wet	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	1.3
Wtd Avg.	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	1.1

D. Groundwater Pumping Sub-Region 19 * Step 4. (inflow) — Flow Path Not Affected

source: CVGSM Sub-Region 19 — Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.1	0.0	0.2	0.1	0.1	0.2	0.2	0.2	0.0	0.0	0.0	0.0	1.0
2) Dry	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.6
3) B Norm	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.5
4) A Norm	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.5
5) Wet	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.4
Wtd Avg.	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.6

E. ET Rain Sub-Region 19 * Step 4. (outflow, irrecoverable) — Flow Path Not Affected

source: CVGSM Sub-Region 19 — Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2
2) Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2
3) B Norm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2
4) A Norm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2
5) Wet	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2
Wtd Avg.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2

F. Runoff from Rain Sub-Region 19 * Step 4. (outflow, irrecoverable) — Flow Path Not Affected

source: CVGSM Sub-Region 19 — Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2) Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3) B Norm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4) A Norm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5) Wet	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wtd Avg.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

G. ETAW Sub-Region 19 * Step 4. (outflow, irrecoverable) Flow Path Not Affected

source: CVGSM Sub-Region 19 Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.1	0.0	0.0	0.0	1.2
2) Dry	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.1	0.0	0.0	0.0	1.3
3) B Norm	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.1	0.0	0.0	0.0	1.2
4) A Norm	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.1	0.0	0.0	0.0	1.2
5) Wet	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.1	0.0	0.0	0.0	1.2
Wtd Avg.	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.1	0.0	0.0	0.0	1.2

H. Export Sub-Region 19 * Step 4. (outflow, irrecoverable)

source: CVGSM Sub-Region 19 Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2) Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3) B Norm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4) A Norm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5) Wet	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wtd Avg.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

I. Surface Water Return Sub-Region 19 * Step 4. (outflow, recoverable)

source: CVGSM Sub-Region 19 Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2) Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3) B Norm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4) A Norm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5) Wet	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wtd Avg.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

J. Groundwater Return Sub-Region 19 * Step 4. (outflow, recoverable)

source: CVGSM Sub-Region 19 Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.8
2) Dry	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	1.1
3) B Norm	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	1.2
4) A Norm	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	1.2
5) Wet	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	1.3
Wtd Avg.	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.0	1.1

K. Evaporation Flows Sub-Region 19 * Step 4. (outflow, irrecoverable)

source: = .02 * (5.B + 5.C - 5.H) Thousand Acre Feet

= .02 * (Surface Water Diversions + Imports - Exports)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2) Dry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3) B Norm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4) A Norm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5) Wet	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wtd Avg.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

L. Sub-Region Water Balance 19 * Step 4.

source: = Step 5.(A + B + C + D) - Step5. (E + F + G + H + I + J + K)

= (Rain + Surface Water Diversions + Import + Groundwater Pumping) - (ET Rain + Runoff from Rain + ETAW + Export + Surface & Groundwater Return + Evaportation)

Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.0	0.1	0.0	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	-0.3
2) Dry	0.1	0.0	0.1	0.0	-0.1	-0.1	-0.2	-0.1	-0.2	-0.1	0.0	0.0	-0.6
3) B Norm	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.1	0.0	0.0	-0.8
4) A Norm	0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.1	0.0	0.0	-0.7
5) Wet	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.1	0.0	0.0	-0.8
Wtd Avg.	0.1	0.0	0.0	0.0	-0.1	-0.1	-0.2	-0.1	-0.2	-0.1	0.0	0.0	-0.6

M. Applied Water Ratio Sub-Region 19 * Step 4.

source: = Step 5.G / Step 5 (B + C+ D - H)

= ETAW/(Surfece Water Diversions + Import + Groundwater Pumping - Export)

Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.5	0.2	0.3	0.6	0.9	0.7	0.9	0.9	1.0	1.0	1.0	1.0	8.9
2) Dry	0.4	0.2	0.3	0.6	0.9	0.7	0.8	0.8	1.0	1.0	1.0	0.7	8.4
3) B Norm	0.4	0.2	0.3	0.6	0.8	0.7	0.8	0.8	1.0	1.0	1.0	0.9	8.6
4) A Norm	0.2	0.1	0.3	0.6	0.9	0.7	0.8	0.8	1.0	1.0	1.0	0.8	8.2
5) Wet	0.2	0.2	0.3	0.6	0.8	0.7	0.8	0.8	1.0	1.0	1.0	0.9	8.3
Wtd Avg.	0.4	0.2	0.3	0.6	0.9	0.7	0.8	0.8	1.0	1.0	1.0	0.9	8.5

N. Groundwater Check Sub-Region 19

source: = Step 5 (J - D)

= Groundwater Return Flows - Groundwater Pumping

Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.0	0.0	-0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	-0.3
2) Dry	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.5
3) B Norm	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.8
4) A Norm	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.7
5) Wet	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.9
Wtd Avg.	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.5

6. Idealized Agricultural Potential

A. Export Adjustment

0% of Export (Step 5H.) water is available for flow/timing changes in Sub-Region Detail

note: Import (Step 5C) and Export (Step 5H) are in the water balance. In this Step (7D) Export water is considered water that flows through districts in Sub-Regions 4, 5, and 7. This water is available to make flow/timing changes

source: CVGSM Sub-Region Detail

Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
2) Dry	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
3) B Norm	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
4) A Norm	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
5) Wet	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0
Wtd Avg.	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.0

B. Idealized Agricultural Potential

source: = Step 5 ((B + C + D) + Step 6A. - Step 5 (G + H))

= Surface Water Diversions + Import + Groundwater Diversions) - (ETAW + Export + Export Adjustment)

Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	---	---	0.4
2) Dry	---	---	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	---	---	0.4
3) B Norm	---	---	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	---	---	0.4
4) A Norm	---	---	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	---	---	0.4
5) Wet	---	---	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	---	---	0.3
Wtd Avg.	---	---	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	---	---	0.4

Step 7 Achievable Agricultural Potential

A. Farm Demand

assumes farm loss fraction of 0.13 for Sub-Region 19, values vary by SubRegion

source: = ETAW / Farm High (1- loss fraction)

Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	0.1	0.1	0.1	0.2	0.3	0.3	0.1	0.0	---	---	1.3
2) Dry	---	---	0.0	0.1	0.2	0.2	0.3	0.3	0.1	0.0	---	---	1.3
3) B Norm	---	---	0.0	0.1	0.1	0.2	0.3	0.3	0.1	0.0	---	---	1.3
4) A Norm	---	---	0.0	0.1	0.2	0.2	0.3	0.3	0.1	0.0	---	---	1.3
5) Wet	---	---	0.0	0.1	0.2	0.2	0.3	0.3	0.1	0.0	---	---	1.3
Wtd Avg.	---	---	0.0	0.1	0.2	0.2	0.3	0.3	0.1	0.0	---	---	1.3

B. Groundwater Pumping after System Improvements

Existing Farm Efficiency for Sub-Region Detail = 0.70

source: = (1 - 0.7 * (1/0.7-1/(1-Farm Loss Fraction))) * Groundwater Pumping

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	---	---	0.7
2) Dry	---	---	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	---	---	0.4
3) B Norm	---	---	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	---	---	0.3
4) A Norm	---	---	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	---	---	0.3
5) Wet	---	---	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	---	---	0.3
Wtd Avg.	---	---	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	---	---	0.4

C. Farm Demand not met by Groundwater Pumping

source: = Step 7.A - Step 7.B

= Farm Demand - Groundwater Pumping

Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	-0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.0	---	---	0.6
2) Dry	---	---	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.0	---	---	0.9
3) B Norm	---	---	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.0	---	---	1.0
4) A Norm	---	---	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.0	---	---	1.0
5) Wet	---	---	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.0	---	---	1.0
Wtd Avg.	---	---	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.0	---	---	0.8

D. Water Supplier Delivery to Meet Farm Demand

assumes district loss fraction of 0.08

source: = Step 7C / District High (1- loss fraction)

= Farm Demand not met by Groundwater Pumping/(1 - 0.08)

Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	-0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.0	---	---	0.6
2) Dry	---	---	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.0	---	---	1.0
3) B Norm	---	---	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.0	---	---	1.0
4) A Norm	---	---	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.0	---	---	1.0
5) Wet	---	---	0.0	0.1	0.1	0.2	0.3	0.2	0.1	0.0	---	---	1.1
Wtd Avg.	---	---	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.0	---	---	0.9

E. Achievable Agricultural Potential

source = Step 5.(B + C - H) + Step 6A - Step 7D.

= Surface Water Diversions + Import - Export + Export Adjustment - Water Supplier Delivery to Meet Farm Demand

Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.1
2) Dry	---	---	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.1
3) B Norm	---	---	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.1
4) A Norm	---	---	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.1
5) Wet	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.1
Wtd Avg.	---	---	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.1

F. Groundwater Check after System Improvements

source = (0.13 * 0.80 * ETAW) + (0.04*(Farm Demand w/o Groundwater - Water Supplier Delivery)) - Groundwater Pumping

Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	---	---	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	0.0	0.0	---	---	-0.8
2) Dry	---	---	-0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	---	---	-0.4
3) B Norm	---	---	-0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	---	---	-0.3
4) A Norm	---	---	-0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	---	---	-0.3
5) Wet	---	---	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	---	---	-0.2
Wtd Avg.	---	---	-0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	---	---	-0.4

Step 8. Quantifiable Objective

source =min(Step 3A Wtd Avg, Step 7E)

Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Wtd Avg	---	---	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	0.1

Detail 189, Decrease Nonproductive ET, SubRegion 19

Step 1. Quantified Targets

A. Acreage Assumed for Reduction of Nonproductive ET

source: CVGSM Sub-Region 19

Crop	Potential for ET Red.	Existing	Assumed for ET Reduction*	
		acres		percent
Pasture	No	1,600	0	0%
Alfalfa	No	38,200	0	0%
Sugar Beet	No	7,300	0	0%
Field	No	7,400	0	0%
Rice	No	0	0	0%
Truck	Yes	7,400	2,220	30%
Tomato	Yes	1,900	570	30%
Orchard	Yes	46,300	13,890	30%
Grains	No	18,700	0	0%
Vineyard	Yes	10,200	3,060	30%
Cotton	No	120,800	0	0%
Citrus and Olives	Yes	3,900	1,170	30%
Total		263,700	20,910	8%

*The Assumed Acreage for ET Reduction is 30% of the crops that have the Potential for ET Reduction.

B. Existing ET for Sub-Region 19

source: CVGSM

Inches

Crop	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Pasture	---	---	---	---	---	---	---	---	---	---	---	---	---
Alfalfa	---	---	---	---	---	---	---	---	---	---	---	---	---
Sugar Beet	---	---	---	---	---	---	---	---	---	---	---	---	---
Field	---	---	---	---	---	---	---	---	---	---	---	---	---
Rice	---	---	---	---	---	---	---	---	---	---	---	---	---
Truck	0.00	0.00	0.00	2.60	2.90	3.30	3.40	1.80	1.30	1.20	0.00	0.00	16.50
Tomato	0.00	0.00	0.00	3.60	6.70	7.60	5.40	1.60	1.00	0.00	0.00	0.00	25.90
Orchard	0.90	1.30	1.70	2.90	4.90	6.00	6.70	5.70	3.50	2.10	1.00	0.70	37.40
Grains	---	---	---	---	---	---	---	---	---	---	---	---	---
Vineyard	0.00	0.00	0.00	1.00	3.70	5.80	6.60	5.50	3.50	1.30	0.00	0.00	27.40
Cotton	---	---	---	---	---	---	---	---	---	---	---	---	---
Citrus and Olives	0.00	0.00	1.90	2.70	4.20	4.80	5.00	4.20	2.80	2.00	0.00	0.00	27.60
Total	0.60	0.86	1.24	2.60	4.52	5.66	6.20	5.06	3.16	1.82	0.66	0.46	32.86

C. ET from Rain for Sub-Region 19

source: CVGSM

Inches

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.00	0.43	0.36	0.44	0.41	0.00	0.39	0.06	2.37	1.19	0.00	0.00	5.63
2) Dry	0.00	0.55	0.68	0.35	0.34	0.00	0.36	0.08	1.75	1.18	0.00	0.00	5.29
3) B Norm	0.03	0.62	0.65	0.57	0.42	0.00	0.36	0.06	1.57	1.22	0.00	0.00	5.51
4) A Norm	0.34	0.67	0.88	0.73	0.21	0.00	0.35	0.05	1.57	1.19	0.00	0.00	5.99
5) Wet	0.45	0.60	1.05	0.92	0.35	0.00	0.34	0.06	1.46	1.23	0.00	0.00	6.46
Wtd Avg.	0.15	0.56	0.69	0.58	0.34	0.00	0.36	0.06	1.80	1.20	0.00	0.00	5.75

D. Existing ETAW for Sub-Region 19

source: calculated = Step 1B.(Average Total) - Step 1C., (set to 0 if Step 1B. - Step 1C. <0) Inches

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.60	0.44	0.88	2.16	4.12	5.66	5.82	5.01	0.79	0.64	0.66	0.46	27.23
2) Dry	0.60	0.31	0.56	2.25	4.19	5.66	5.84	4.98	1.41	0.65	0.66	0.46	27.57
3) B Norm	0.57	0.25	0.58	2.03	4.10	5.66	5.84	5.00	1.59	0.61	0.66	0.46	27.35
4) A Norm	0.26	0.20	0.36	1.87	4.31	5.66	5.86	5.01	1.59	0.63	0.66	0.46	26.87
5) Wet	0.14	0.26	0.18	1.68	4.18	5.66	5.87	5.00	1.70	0.60	0.66	0.46	26.39
Wtd Avg.	0.45	0.30	0.54	2.02	4.18	5.66	5.84	5.00	1.36	0.63	0.66	0.46	27.11

E. Target ETAW for Sub-Region 19

source: calculated = Step 1D. * 90% Inches

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.54	0.39	0.79	1.94	3.70	5.09	5.23	4.50	0.71	0.57	0.60	0.42	24.51
2) Dry	0.54	0.28	0.50	2.02	3.77	5.09	5.26	4.48	1.27	0.58	0.60	0.42	24.81
3) B Norm	0.51	0.22	0.52	1.82	3.69	5.09	5.26	4.50	1.43	0.55	0.60	0.42	24.61
4) A Norm	0.23	0.18	0.32	1.68	3.88	5.09	5.27	4.51	1.43	0.57	0.60	0.42	24.18
5) Wet	0.13	0.24	0.16	1.51	3.76	5.09	5.28	4.50	1.53	0.54	0.60	0.42	23.75
Wtd Avg.	0.40	0.27	0.49	1.82	3.76	5.09	5.26	4.50	1.22	0.56	0.60	0.42	24.39

Step 2. Reference Condition

For ET Reduction the Reference Condition is the existing Crop ET, Step 1B.

Step 3. Quantified Targeted Benefit Change

A. Quantified Targeted Benefit Change for Sub-Region 19

source: calculated = Step 1D - Step 1E Inches

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.06	---	0.09	0.22	0.41	0.57	0.58	0.50	0.08	0.06	0.07	---	2.63
2) Dry	0.06	---	---	0.22	0.42	0.57	0.58	0.50	0.14	0.06	0.07	---	2.62
3) B Norm	---	---	0.06	0.20	0.41	0.57	0.58	0.50	0.16	0.06	0.07	---	2.61
4) A Norm	---	---	---	0.19	0.43	0.57	0.59	0.50	0.16	0.06	0.07	---	2.56
5) Wet	---	---	---	0.17	0.42	0.57	0.59	0.50	0.17	0.06	0.07	---	2.53
Wtd Avg.	---	---	---	0.20	0.42	0.57	0.58	0.50	0.14	0.06	0.07	---	2.59

B. Quantified Targeted Benefit Change for Sub-Region 19

source: calculated = Step 1D - Step 1E Thousand Acre Feet

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1) Critical	0.10	---	0.15	0.38	0.72	0.99	1.01	0.87	0.14	0.11	0.12	---	4.6
2) Dry	0.10	---	---	0.39	0.73	0.99	1.02	0.87	0.25	0.11	0.12	---	4.6
3) B Norm	---	---	0.10	0.35	0.72	0.99	1.02	0.87	0.28	0.11	0.12	---	4.5
4) A Norm	---	---	---	0.33	0.75	0.99	1.02	0.87	0.28	0.11	0.12	---	4.5
5) Wet	---	---	---	0.29	0.73	0.99	1.02	0.87	0.30	0.10	0.12	---	4.4
Wtd Avg.	---	---	---	0.35	0.73	0.99	1.02	0.87	0.24	0.11	0.12	---	4.5

Step 4. Area Affected by Targeted Benefit

Area affected are the 20,910 acres identified in Step 1A.

Step 5. Water Flow Path Elements

The flow path elements used in this analysis are given in Step 1.

Step 6. Idealized Agricultural Potential

Additional ET research is required to determine this component.

Step 7. Achievable Agricultural Potential

The farm Available Agricultural Potential is the same as Step 3B.

Step 8. Quantifiable Objective

A. For ET Reduction the Quantifiable Objective is Step 3B